What is claimed is:

1. An objective unit comprising:

an objective lens;

objective holding means for holding said objective lens so that said objective lens can be spatially moved;

at least one actuator for driving said objective lens; and

an outer frame member for integrally supporting said objective lens, said objective holding means, and said actuator.

2. An objective unit according to claim 1, wherein light incident on said objective lens satisfies the following condition:

$$I_{off} / I_{on} \geqq 0.135$$

where I_{on} is a light intensity at a center of illumination light and I_{off} is a light intensity at a position of a radius of d + Dp / 2 from the center of said illumination light, where Dp is a pupil diameter of said objective lens and d is a maximum amount of movement of said objective lens moved by said actuator, that is, a distance from the center of said illumination light to an optical axis of said objective lens.

3. An objective unit according to claim 2, further comprising an element which combines a light source with a photodetector and a relay optical system which introduces light from said element into said objective lens and at the same time, introduces again signal light from a specimen, passing through said objective lens, into said element.

4. An objective unit according to claim 2, further comprising a light source, a photodetector, and a light splitting and combining member which introduces light from said

light source into said objective lens and introduces signal light passing through said objective lens into said photodetector.

5. An objective unit according to claim 2, further comprising three sets of actuators so that a first actuator is placed to move said objective lens in a first direction, a second actuator is placed to move said objective lens in a second direction different from said first direction, and a third actuator is placed to move said objective lens in a third direction different from each of said first direction and said second direction.

6. An objective unit according to claim 2, wherein said outer frame member has a plane-parallel transparent member, said transparent member being placed at a top of said objective lens.

7. An objective unit according to claim 2, wherein said objective holding means holds a plurality of objective lenses.

8. An objective unit according to claim 7, wherein said outer frame member has a plurality of units, each including said objective lens, said objective holding means, and said actuator.

9. An optical apparatus having an objective unit, said objective unit comprising:

an objective lens;

objective holding means for holding said objective lens so that said objective lens can be spatially moved;

at least one actuator for driving said objective lens; and

an outer frame member for integrally supporting said objective lens, said objective

holding means, and said actuator.

10. An optical apparatus according to claim 9, wherein light incident on said objective lens satisfies the following condition:

$$I_{off} / I_{on} \geqq 0.135$$

where I_{on} is a light intensity at a center of illumination light and I_{off} is a light intensity at a position of a radius of d + Dp / 2 from the center of said illumination light, where Dp is a pupil diameter of said objective lens and d is a maximum amount of movement of said objective lens moved by said actuator, that is, a distance from the center of said illumination light to an optical axis of said objective lens.

11. An optical apparatus according to claim 10, wherein said objective unit has an element which combines a light source with a photodetector and a relay optical system which introduces light from said element into said objective lens and at the same time, introduces again signal light from a specimen, passing through said objective lens, into said element.

12. An optical apparatus according to claim 10, wherein said objective unit has a light source, a photodetector, and a light splitting and combining member which introduces light from said light source into said objective lens and introduces signal light passing through said objective lens into said photodetector.

13. An optical apparatus according to claim 10, wherein said objective unit has three sets of actuators so that a first actuator is placed to move said objective lens in a first direction, a second actuator is placed to move said objective lens in a second direction different from said first direction, and a third actuator is placed to move said objective

lens in a third direction different from each of said first direction and said second direction.

14. An optical apparatus according to claim 10, further having an illumination and detection unit including a light source, a photodetector, and a light splitting and combining member which introduces light from said light source into said objective lens and introduces signal light passing through said objective lens into said photodetector.

15. An optical apparatus according to claim 10, wherein a plane-parallel transparent member is placed at a top of said objective lens.

16. An optical apparatus according to claim 10, wherein said objective holding means holds a plurality of objective lenses, and said optical apparatus has beam diameter converting means for producing a light beam which is incident on all said plurality of objective lenses, and a plurality of photodetectors.

17. An optical apparatus according to claim 10, wherein said outer frame member has a plurality of units, each including said objective lens, said objective holding means, and said actuator.

18. An observation method using an optical apparatus which has an objective unit including an objective lens, objective holding means for holding said objective lens so that said objective lens can be spatially moved, at least one actuator for driving said objective lens, and an outer frame member for integrally supporting said objective lens, said objective holding means, and said actuator and which is provided with a plane-parallel transparent member at a top of said objective lens, so that a space between said transpar-

ent member and a specimen is filled with a transparent liquid medium to observe said specimen.

19. An observation method according to claim 18, wherein a space between said objective lens and said transparent member is filled with a different transparent liquid medium of substantially the same refractive index as a refractive index of said transparent liquid medium.